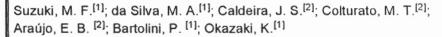


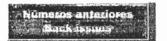
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## Radiobiology / Radiopharmacy / Radiochemistry



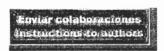


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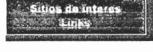
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## Cita/Reference:

Suzuki, M. F.; da Silva, M. A.; Caldeira, J. S. et al. Induction of micronucleus by [DOTA, Tyr3]octreotate labeled with <sup>131</sup>I and <sup>177</sup>Lu in peripheral blood lymphocytes IN VITRO. Alasbimn Journal 7(27): January 2005



Induction of micronucleus by [DOTA, Tyr3]octreotate labeled with 131 and <sup>177</sup>Lu in peripheral blood lymphocytes IN VITRO

The use of radiolabeled somatostatin analogue is of great interest in nuclear medicine for diagnostic and therapy of neuroendocrine tumors. A somatostatin analogue [DOTA, Tyr3]octreotate has been used because of its high affinity for somatostatin subtype receptors sstr2 and sstr5. The pharmacokinetic study showed that the blood clearance is rapid and only 9% of the intravenous injected activity remains in blood after one hour. In this study, we evaluated the cytogenetic damage in peripheral blood lymphocytes of healthy donors exposed to different radioactive concentration of [DOTA, Tyr3]octreotate labeled with 131 (n=3) and 177Lu (n=2), range between 600 and 4700 kBq/mL, that correspond to an injected activity of 3.1 to 24.4 GBq (83 to 660 mCi) in a reference man with 70kg weight. 131 emits gamma rays with 365 and 637 keV and beta particles of Emax 495 keV with a physical half-life of 8.1d and 177 Lu emits gamma rays with 113 and 208 keV and beta particles of Emax 600 keV with a physical half-life of 6.7d. Cytokinesis-block micronucleus (MN) assay was applied in total peripheral blood cells after one hour of exposure at 37oC, washing three times with RPMI 1640 medium to remove labeled octreotate. The results obtained indicated significant correlations between radioactive concentrations (X) and the frequency of micronuclei in binucleated cells (Y) (P<0.05). The equation for [131I-DOTA, Tyr3] octreotate was Y =  $(0.01841 \pm 0.002880) + (0.9946 \pm 0.1452) 10-5 X$  and for [ $^{177}$ Lu-DOTA, Tyr3]octreotate was Y = (0.01641 ± 0.001641) + (0.5404)  $\pm$  0.04642) 10-5 X. Comparing the slopes (Y = a + bD), [DOTA, Tyr3] octreotate labeled with 131 was more damaging than that labeled with



<sup>177</sup>Lu (P<0.05). One of the limiting factors in radionuclide therapy is the dose absorbed by normal tissues. The higher genotoxic effect in lymphocytes exposed to <sup>131</sup>I compared to <sup>177</sup>Lu could be the consequence of differences in ionization field caused by gamma and beta particles. The dose-response curve allowed us to measure the genotoxicity of these compounds in peripheral blood lymphocytes and will help us to check the absorbed dose in peripheral blood of patients, analyzing the MN frequency before and after treatment.

Preparation and evaluation of the biodistribution of technetium-99m substituted ethylenediamine complex | <sup>131</sup>I-Vasoactive Intestinal Peptide ([<sup>131</sup>I]VIP) for Receptor Scintigraphy in Oncology. Compative Biological Distribution Studies in Normal and Turmour Animals | Preparation and quality control of <sup>131</sup>I-MB (Methylene Blue) | Synthesis of 2-[18F] fluor-2 deoxy-D-glucose (18F-FDG) | Labeling of DOTA-Tyr3-octreotate with <sup>177</sup>Lu: stability and biodistribution study | Exposure to radiation of nursing assistants during iodine therapy in a period of eleven years | Cytogenetic effects of <sup>131</sup>I administered with recombinant human thyrotropin hormone (rec-hTSH) on blood lymphocyte of Wistar rat | Induction of micronucleus by [DOTA, Tyr3]octreotate labeled with <sup>131</sup>I and <sup>177</sup>Lu in peripheral blood lymphocytes IN VITRO |

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